

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of All Pending Claims

1. (currently amended) A tunable isolator circuit comprising:

an isolator formed on a substrate comprising an input port, an output port and an isolation port coupled to a ground;

an isolation port circuit formed on the substrate and coupled to the isolation port of the isolator, the isolation port circuit comprising:

a first ferro-electric (FE) tunable component coupled between the isolation port and a first connection point, wherein the first FE tunable component is responsive to a first control signal for adjusting a first electrical characteristic of the first FE tunable component;

a second ferro-electric (FE) tunable component coupled between the first connection point and the ground, wherein the second FE tunable component is responsive to a second control signal for adjusting a second electrical characteristic of the second FE tunable component;

a resistive element in parallel with the second FE tunable component and coupled between the first connection point and the ground; and wherein the first FE tunable component and the second FE tunable component are adjustable during operation of the tunable isolator circuit at an operating frequency to tune the isolation port circuit to resonate at the operating frequency;

an input matching circuit formed on the substrate having a first signal port coupled to the input port of the isolator and a second signal port coupled for connection

to an electrical component, the input matching circuit comprising:

a first signal path from the first signal port to the second signal port; and
a third ~~first~~ ferro-electric (FE) tunable component coupled between the first signal port and the second signal port along the first signal path, wherein the third ~~first~~ ferro-electric tunable component is responsive to a third control signal for adjusting an impedance of the input matching circuit; and

an output matching circuit formed on the substrate having a third signal port coupled to the output port of the isolator and a fourth signal port for connection to an antenna circuit, the output matching circuit comprising:

a second signal path from the third signal port to the fourth signal port;
and

a fourth ferro-electric (FE) tunable component coupled between the third signal port and the fourth signal port along the second signal path, wherein the fourth ferro-electric tunable component is responsive to a fourth control signal for adjusting an impedance of the output matching circuit.

2. (currently amended) The tunable isolator circuit of claim 1, wherein the second FE ~~first ferro-electric~~ tunable component comprises a second ferro-electric tunable capacitor having an adjustable capacitance.

3. (canceled)

4. (previously presented) The tunable isolator circuit of claim 1, wherein the input matching circuit matches impedances between the isolator and the electronic component, wherein the electronic component is a power amplifier.

5. (currently amended) The tunable isolator circuit of claim 1, wherein the input

matching circuit further comprises a fifth ~~second~~ ferro-electric FE tunable component coupled between the first signal path and ~~an electrical~~ the ground.

6. (currently amended) The tunable isolator circuit of claim 5, wherein the fifth FE ~~second ferro-electric~~ tunable component comprises a fifth tunable ferro-electric capacitor.

7. - 8. (canceled)

9. (currently amended) The tunable isolator circuit of claim 1 ~~[[7]]~~, wherein the output matching circuit further comprises a sixth ~~fourth~~ ferro-electric FE tunable component coupled between the second signal path and ~~an electrical~~ the ground.

10. (currently amended) The tunable isolator circuit of claim 9, wherein the sixth FE ~~fourth ferro-electric~~ tunable component comprises a sixth tunable ferro-electric capacitor.

11. -12 (canceled)

13. (currently amended) The tunable isolator circuit of claim 1 ~~[[7]]~~, wherein the output matching circuit matches a natural output impedance of the isolator to a natural input impedance of the antenna circuit ~~second electrical component~~.

14. (currently amended) The tunable isolator circuit of claim 13, wherein the antenna circuit comprises ~~second electrical component~~ is a duplexer, and wherein the output matching circuit matches from about 12.5 ohms at the isolator output port to about 12.5 ohms at a duplexer input port.

15. (currently amended) The tunable isolator circuit of claim 4 ~~[[8]]~~, wherein the input matching circuit matches a natural output impedance of the power amplifier to a natural input impedance of the isolator.

16. (previously presented) The tunable isolator circuit of claim 15, wherein the input matching circuit matches from about 2 ohms at a power amplifier output port to about 12.5 ohms at the isolator input port.

17. (currently amended) The tunable isolator circuit of claim 4 ~~[[7]]~~, wherein the output matching circuit matches a natural output impedance of the isolator to a natural input impedance of the antenna circuit ~~second electrical component~~ coupled to the output port of the isolator, and wherein the input matching circuit matches a natural output impedance of the power amplifier to a natural input impedance of the isolator.

18. -19. (canceled)

20. (currently amended) A tunable isolator circuit formed on a single substrate, comprising:

an isolator formed on the substrate comprising an input port, an output port and an isolation port coupled to a ground;

an input matching circuit formed on the substrate having a first signal port coupled to the input port of the isolator and a second signal port for connection ~~coupled to a power amplifier~~ ~~an electrical component~~, the input matching circuit comprising:

~~a signal path from the first signal port to the second signal port; and~~
a first ferro-electric tunable component coupled between the first signal port and the second signal port ~~along the signal path~~, wherein the first ferro-electric tunable component is responsive to a first control signal for adjusting an the impedance of the input matching circuit to match a natural input impedance of the tunable isolator circuit to a natural output impedance of the power amplifier; and

an output matching circuit formed on the substrate having a third signal port coupled to the output port of the isolator and a fourth signal port for connection ~~coupled to an antenna circuit~~ ~~a second electrical component~~, the output matching circuit comprising:

~~the signal path from the third signal port to the forth signal port; and~~
a second ferro-electric tunable component coupled between the third signal port and the fourth signal port ~~along the signal path~~, wherein the second ~~circuit~~ ferro-electric tunable component is responsive to a second control signal for adjusting the impedance of the output matching circuit to match a natural output impedance of the tunable isolator circuit to a natural input impedance of the antenna circuit;
and

an isolation port circuit coupled to the isolation port of the isolator comprising:

~~a first isolation circuit~~ third ferro-electric tunable capacitor ~~component~~
coupled between the isolation port and a first connection point,

wherein the third ferro-electric tunable capacitor is responsive to a third control signal to adjust a third capacitance of the third ferro-electric tunable capacitor;

~~a second isolation circuit~~ fourth ferro-electric tunable capacitor component coupled between the first connection point and the ground, wherein the fourth ferro-electric tunable capacitor is responsive to a fourth control signal to adjust a fourth capacitance of the third ferro-electric tunable capacitor;

a resistive element coupled between the first connection point and the ground;

wherein the third ferro-electric tunable capacitor and the fourth ferro-electric tunable capacitor are adjustable during operation of the tunable isolator circuit at an operating frequency to tune the isolation port circuit to resonate at the operating frequency.

21. - 22. (canceled)